WEB3 DEVELOPMENT

Building the Future of the Internet

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What is Blockchain?

- Blockchain technology was first outlined in 1991 by Stuart Haber and W. Scott Stornetta, two researchers who wanted to implement a system where document timestamps could not be tampered.

- But it took two decades, with the launch of Bitcoin in January 2009, that blockchain had its first real-world application.

- Blockchain is a distributed database or ledger that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format. Blockchains are best known for their crucial role in cryptocurrency systems, such as Bitcoin.

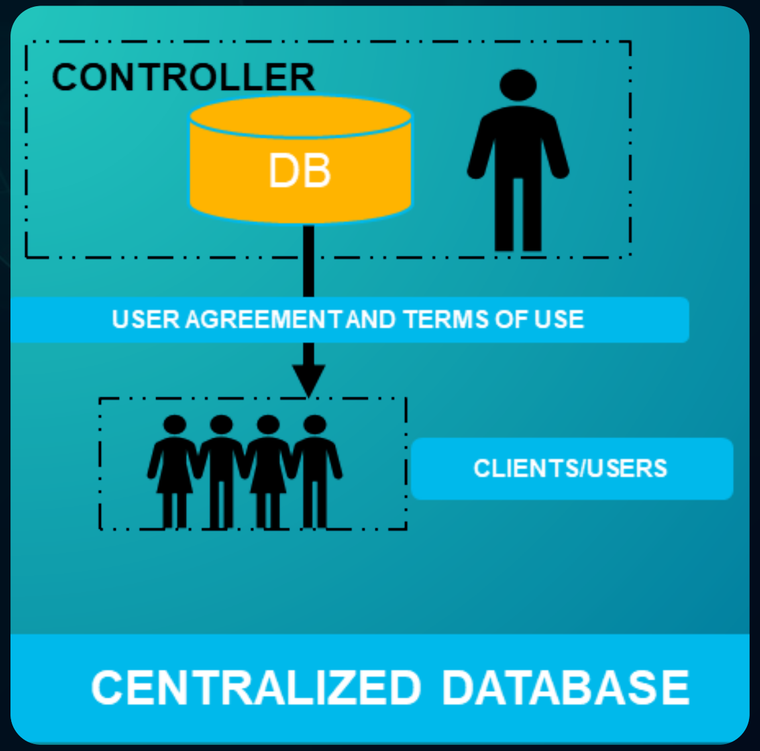
Why Blockchain Matters

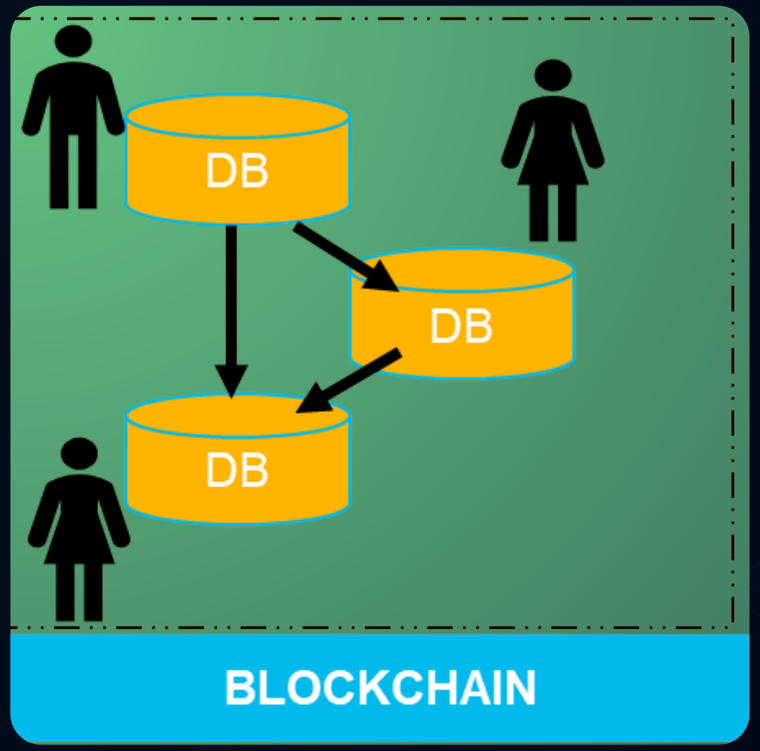
Security Through Decentralization: No central authority (like a bank) controls the data; it’s shared across many participants (nodes).

Immutability: Once information is added to a block, it can’t be changed, reducing the risk of fraud.

Transparency: Every participant in the blockchain network can see the transaction history.

Typical Database Vs Blockchain





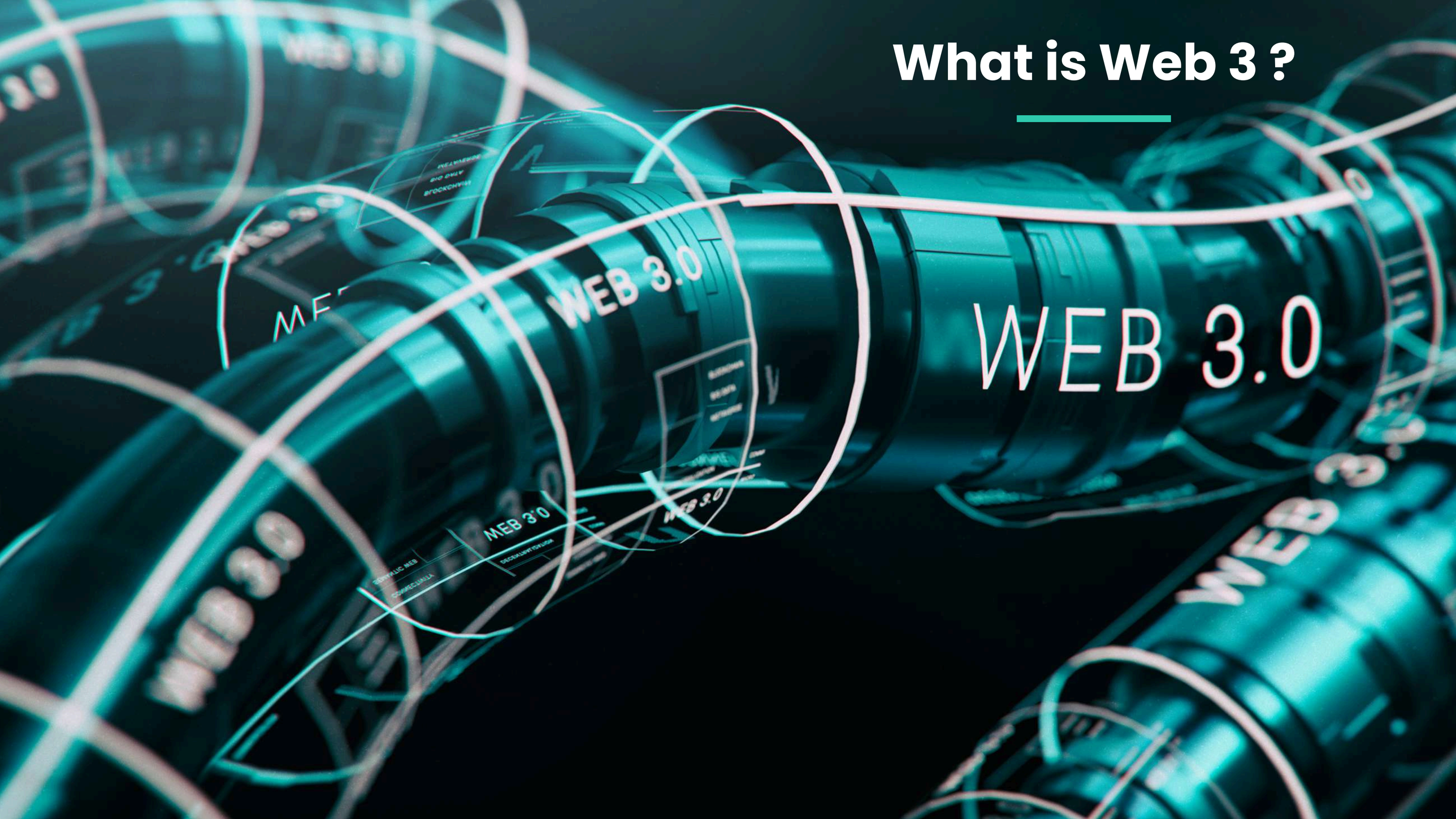
Typical Database Vs Blockchain

- One key difference between a typical database and a blockchain is how the data is structured. A blockchain collects information together in groups, known as blocks, that hold sets of information.

- Blocks have certain storage capacities and, when filled, are closed and linked to the previously filled block, forming a chain of data known as the blockchain.

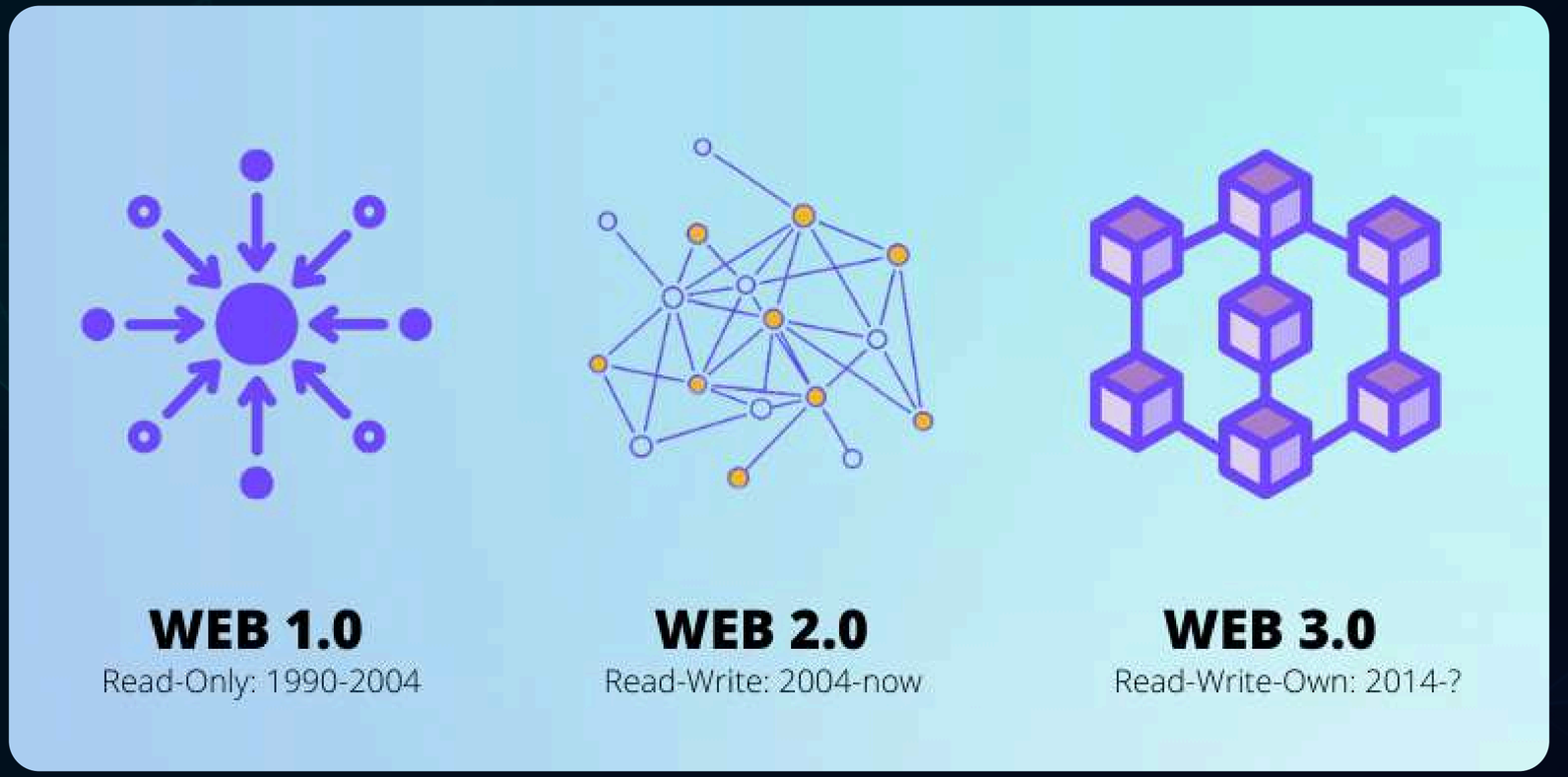
- A database usually structures its data into tables, whereas a blockchain, as its name implies, structures its data into chunks (blocks) that are strung together. This data structure inherently makes an irreversible timeline of data when implemented in a decentralized nature.

What is Web 3 ?



- Web3 is a big change in how we build applications with Big Ideas.
- Also Building trust, With Web3, trust is provided by code, which means people don't have to rely on middlemen.
- With Web3 users can have ownership.
- By removing the middleman, tax people can finally own the upside of their work.
- Web3 Matters because we are building an internet owned by people instead of middleman.

Let's compare Web1, Web2 and Web3



Web3 is built on a peer-to-peer networks of computers that talk to each other without middlemen.

Web 1

The Information Economy

Web 2

The Platform Economy

Web 3

The Ownership Economy

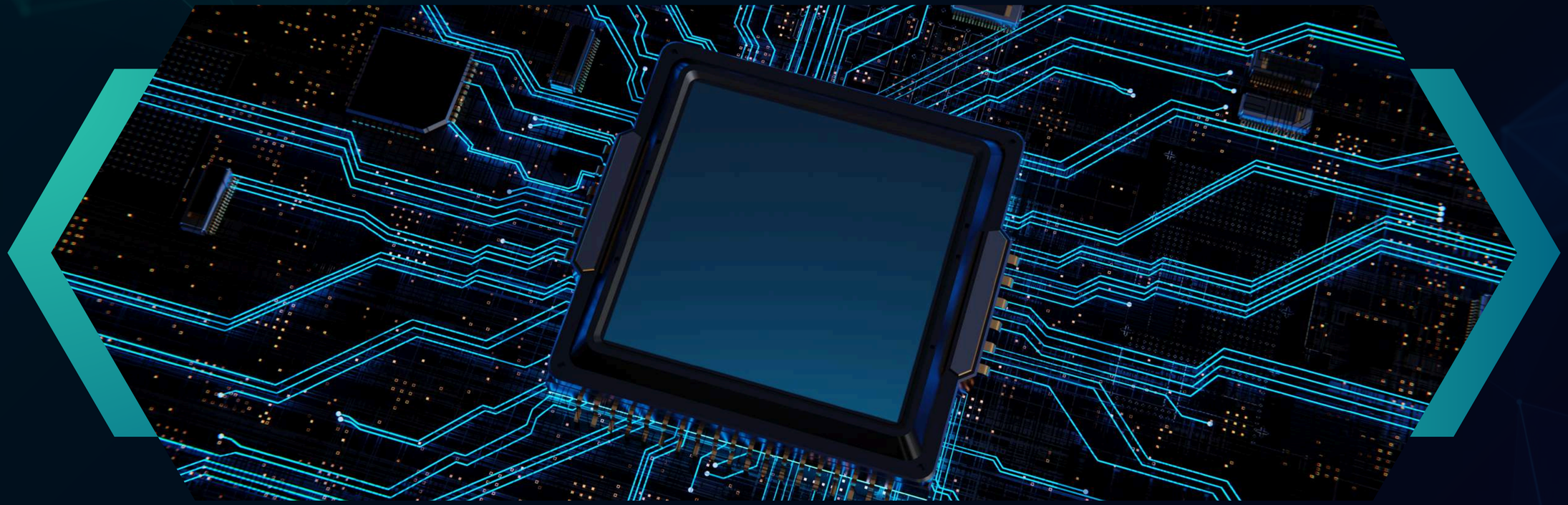
Web3 Adoption over the Years

Huge Mistake

I see many total beginners without any coding experience, diving straight into Web3 development. You will really struggle if you do this because blockchain is built on top of web technologies

Blockchain Development

1. Blockchain core development
2. Blockchain App development (Web3 Dev)



Blockchain Core Development

- For blockchain core development, because blockchain clients needs to be very performant, we have to use low level programming languages like C, C++ , Golang, Rust, etc.

- These programming languages tend to be significantly harder than high level languages like JavaScript or Python, and that's why blockchain core development is not for beginners.

Blockchain App Development

- Now the good news is that most blockchain developers do not do core development.

- Most blockchain developers do blockchain app development, which means they build applications on top of the blockchain.

- Blockchain app development means that you build applications on top of the blockchain, so that's what we call a decentralized application or Dapp. (a.k.a Web3 Dev)

Pros and Cons of DApp's

PROS	CONS
Censorship Resistant	Slow
No Downtime	Expensive
Secure	Poor UX

TYPES OF DAPPS

1. DEFI Applications
2. NFT Applications
3. Gaming Applications

COMMON PROTOCOLS

Common

Featured

Common is a multichain set of tools that brings innovation to on-chain trading. Make your trades fast, private, and respectful of AML/CFT regulations.

About Common

Common is a multichain set of tools that brings innovation to on-chain trading. Make your trades fast, private, and respectful of AML/CFT regulations.

Cardinal Cryptography, the core developer of Aleph Zero, has just teased a refreshed vision for Common.

Common is a private DeFi suite of innovative tools that allows you to trade efficiently and privately while remaining compliant with regulations.

NFT’s

NFT’s - Non fungible tokens
It’s a way to create digital assets on the blockchain.
ex: Bored APE Yacht Club - famous project in the space.
Each NFT represents a unique ape, which also gives access to some private events in real life.

Beside digital art, NFTs have many other application like financial assets, membership to a group, certificates, and also in-game assets.

Blockchain Gaming

- Blockchain games is also a big application of blockchain. Gamers want to retain ownership of the asset that they buy in games, and this is where the gaming industry is going.

- Example - DRKVRS : A very popular Gaming platform built on Aleph Zero Blockchain.

More Applications

- If you want to see an example of a NFT app, you can check out **Opensea**. a marketplace for NFTs where people can buy and sell NFTs in a decentralized way.

- And if you want to see even more Dapps, you can check out a website called **Dapp Radar**.

- You will notice one thing when you check out decentralized applications for the first time. They really look and feel like a web application, and that's because for a large part it's what they are.

Architecture of a Dapp

React

User
Interaction

Front End

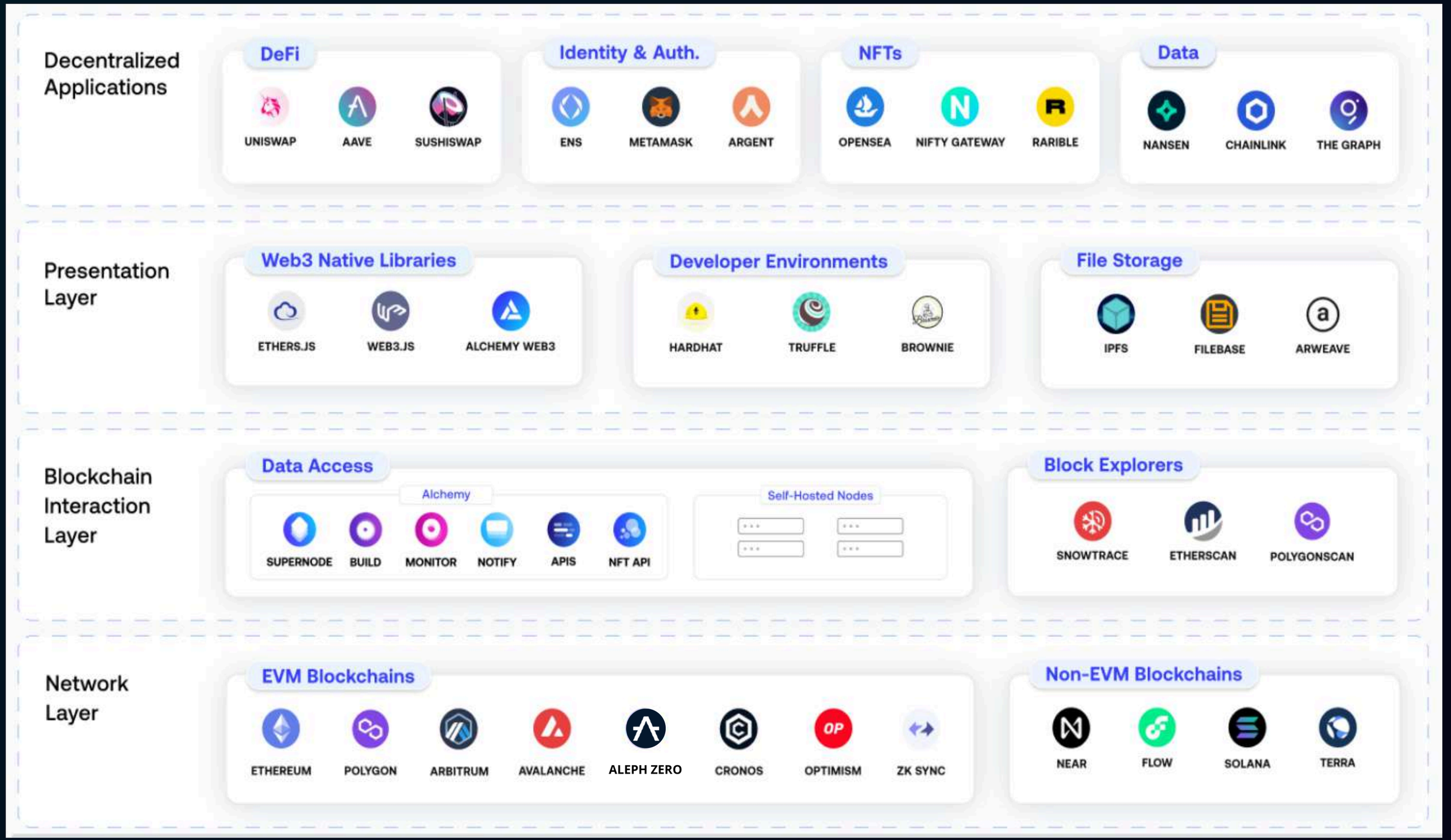
Deployed

Smart
Contract

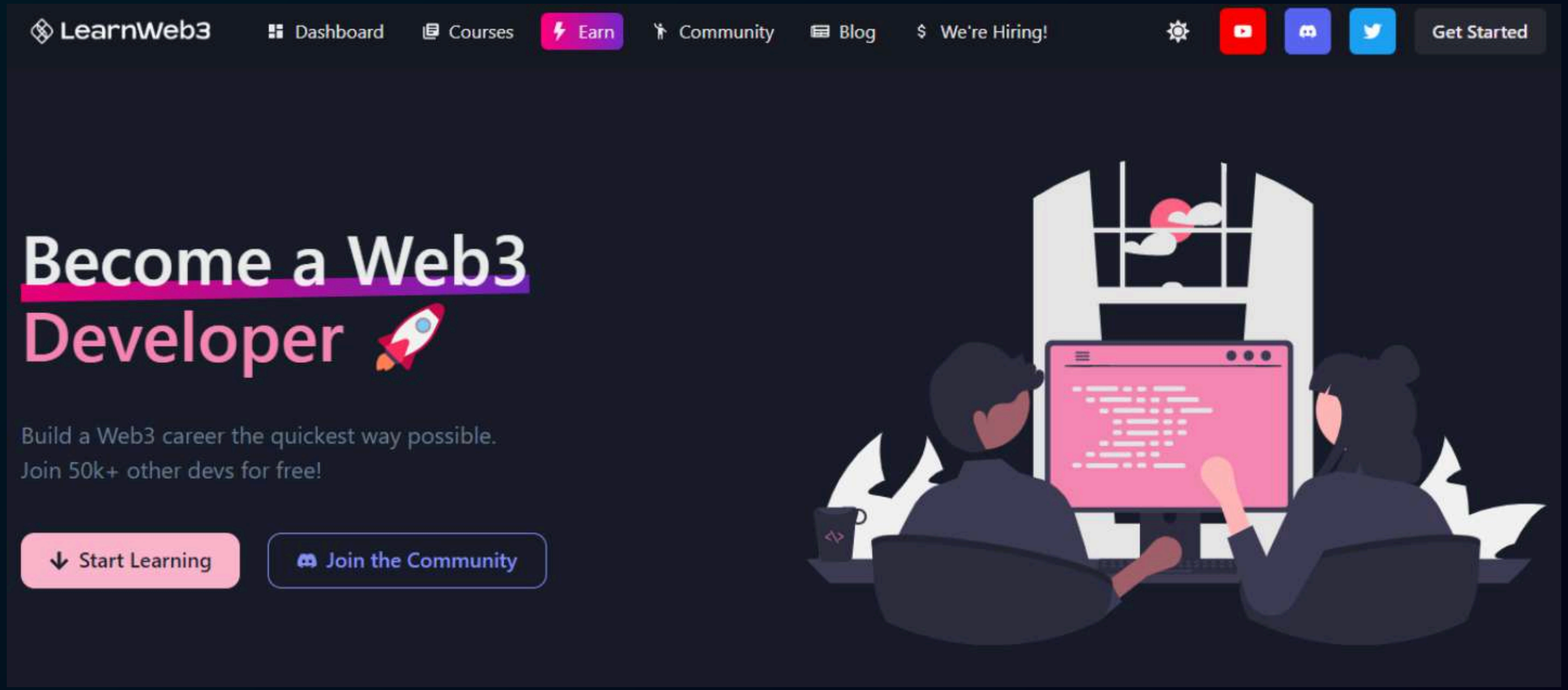
Ethereum Virtual
Machine (EVM)

Blockchain

The Web3 Stack


Decentralized Applications
DeFi
UNISWAP
AAVE
SUSHISWAP
Identity & Auth.
ENS
METAMASK
ARGENT
NFTs
OPENSEA
NIFTY GATEWAY
RARIBLE
Data
NANSEN
CHAINLINK
THE GRAPH
Presentation Layer
Web3 Native Libraries
ETHERS.JS
WEB3.JS
ALCHEMY WEB3
Developer Environments
HARDHAT
TRUFFLE
BROWNIE
File Storage
IPFS
FILEBASE
ARWEAVE
Blockchain Interaction Layer
Data Access
Alchemy
SUPERNODE
BUILD
MONITOR
NOTIFY
APIS
NFT API
Self-Hosted Nodes
Block Explorers
SNOWTRACE
ETHERSCAN
POLYGONSCAN
Network Layer
EVM Blockchains
ETHEREUM
POLYGON
ARBITRUM
AVALANCHE
ALEPH ZERO
CRONOS
OPTIMISM
ZK SYNC
Non-EVM Blockchains
NEAR
FLOW
SOLANA
TERRA

Learn Web3 DAO



Resources

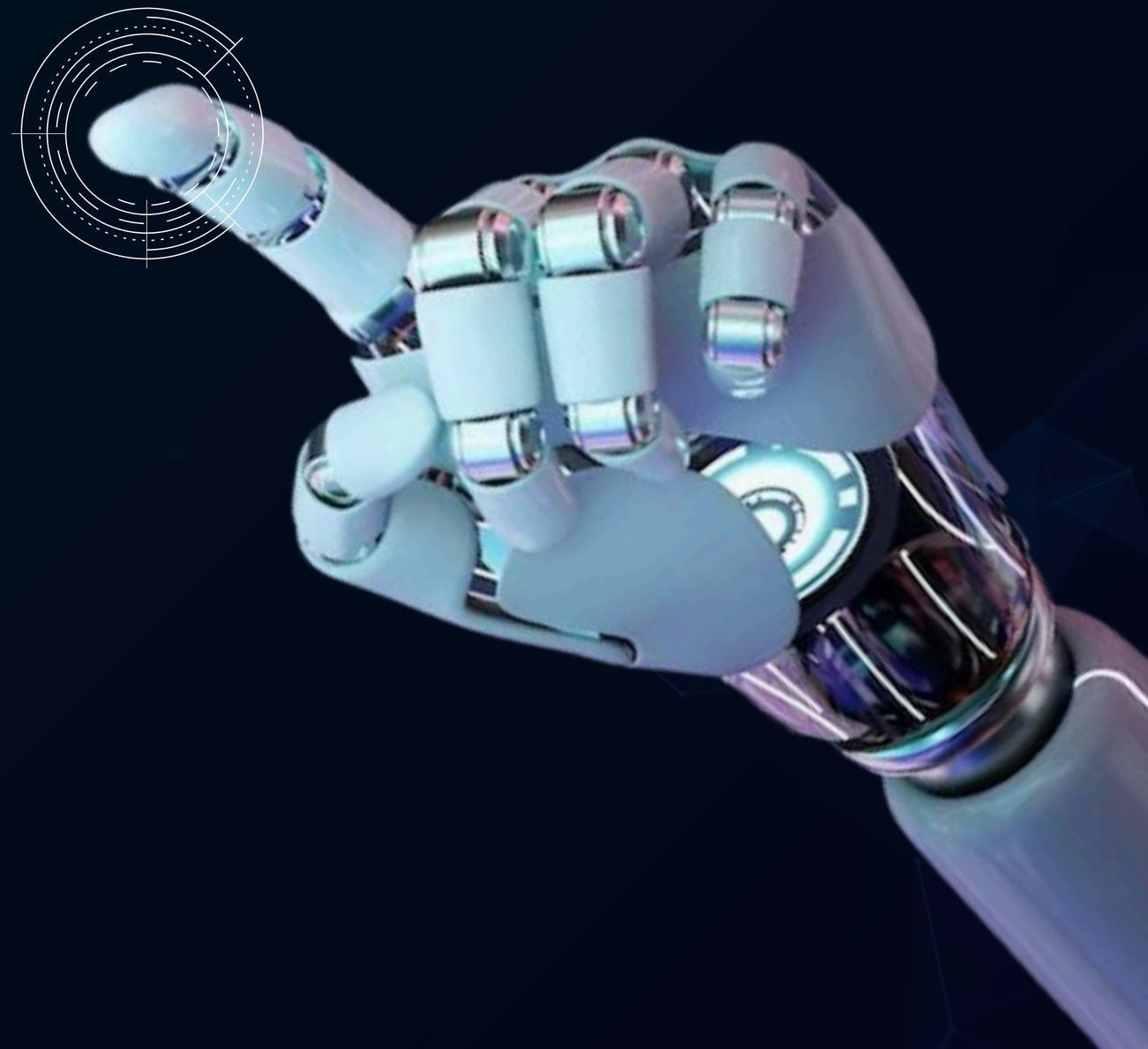
Learn Blockchain, Solidity, and Full Stack Web3 Development - 32 hrs
https://www.youtube.com/watch?v=gyMwXuJrbJQ

Learn Web3 DAO - (Web3 B.Tech)
https://learnweb3.io/

Solidity - Practice
https://cryptozombies.io/

Alchemy University
http://web3.university/

Hackathons
ETH Global, Devfolio, DoraHacks



ALEPH ZERO

FOUNDATION

What is **Aleph Zero?**

- A **Layer-1** protocol focused on both scalability and security.
- Designed for **private and public use cases**, combining decentralized security with privacy solutions.
- Uses **Directed Acyclic Graph (DAG)** for fast transaction throughput.

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Aleph Zero = High Performance, Privacy Enhanced Blockchain

ALEPH ZERO

Aleph Zero's **Unique** Features

Scalability & Speed: Uses a DAG architecture to enable thousands of transactions per second (TPS), ensuring low latency and high scalability.

Privacy Solutions: Aleph Zero integrates privacy-focused features like Zero-Knowledge Proofs (ZKPs) to enable private, yet verifiable transactions.

Decentralization: No single entity controls the network, promoting security through decentralization.

Interoperability: Supports the development of cross-chain solutions, meaning Aleph Zero can interact with other blockchains.

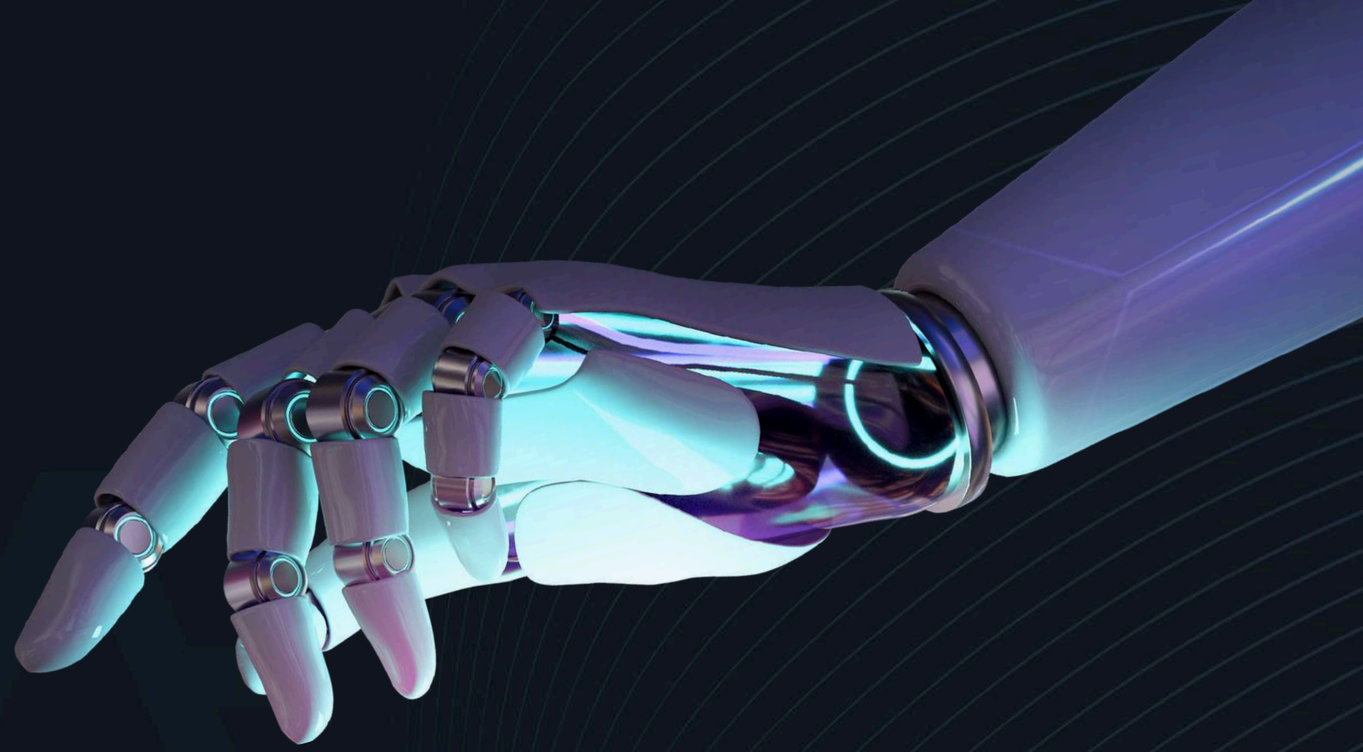
Privacy with **Zero-Knowledge Proofs**

What are ZKPs?

A cryptographic method that allows one party to prove to another that something is true without revealing the underlying data.

- **Example:** Proving you are over 18 without showing your actual birthdate.
- **Why It Matters:** ZKPs provide confidentiality and security, essential for protecting sensitive data in blockchain transactions.

Aleph Zero's **Applications**



DeFi (Decentralized Finance):
Faster and more secure financial applications.

Supply Chain Management:
Transparent tracking of goods with enhanced privacy.

Digital Identity:
Safeguarding personal information through blockchain's decentralized structure.

Healthcare:
Secure patient data sharing and management using blockchain privacy.

How Aleph Zero **Stands Out**

DAG Architecture: Unlike traditional blockchains that process blocks in a chain, Aleph Zero's DAG allows multiple transactions to be processed simultaneously, boosting performance.

Privacy Layers: Strong focus on data privacy using advanced cryptography.

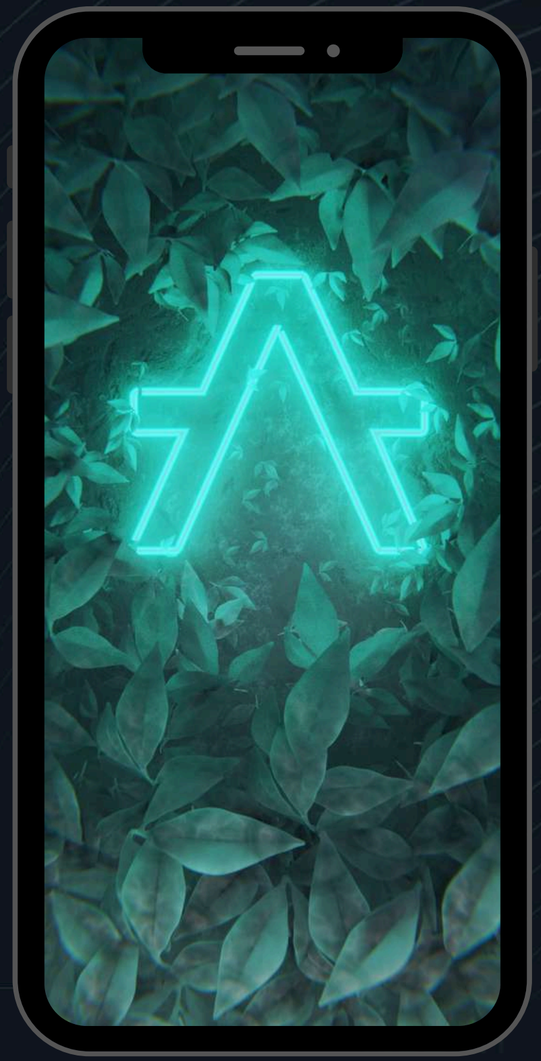
Fast & Low-Cost Transactions: Thousands of transactions per second with minimal transaction fees.

Why Should You **Care**?

Future-Proof Technology: Blockchain is already transforming industries like finance, logistics, and digital identity.

Ownership & Control: Blockchain gives users control over their data, reducing reliance on intermediaries like banks or tech giants.

Aleph Zero's Contribution: By combining speed, scalability, and privacy, Aleph Zero represents the next evolution of blockchain technology, ideal for various real-world applications.



Getting **Started** with Aleph Zero

01 **Create a Wallet**: Use Aleph Zero Wallet to store and manage tokens.

02 **Explore the Ecosystem:** Try out ZKOS or Common.

03 **Start Building:** Access resources and developer tools on the Aleph Zero GitHub.

04 **Join the Community:** Participate in discussions and events on the Aleph Zero Discord and other forums.

Recap – Key Takeaways

Why It's Important: Blockchain and Aleph Zero are reshaping the way we think about data, security, and digital transactions.

Blockchain: A secure, decentralized way to record transactions.

Aleph Zero: A scalable, privacy-focused blockchain using advanced cryptography and DAG architecture.

Questions

Open floor for questions on how blockchain or Aleph Zero works, or about its real-world applications.

Thank you

Join **Aleph Zero India** Community

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